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WARZYN

PROJECT
20007001

SAMPLING PLAN
TREATABILITY STUDIES

AMERICAN CHEMICAL SERVICES NPL SITE
GRIFFITH, INDIANA

DECEMBER 1992

PREPARED FOR:
AMERICAN CHEMICAL SERVICES SITE
TECHNICAL COMMITTEE

•••

PREPARED BY:
WARZYN INC.
ADDISON, ILLINOIS

PROJECT
20007001

SAMPLING PLAN
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AMERICAN CHEMICAL SERVICES NPL SITE
GRIFFITH, INDIANA

DECEMBER 1992

Martin J. Hamper
Project Manager

Mark S. Rothas
Senior Project Engineer

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OBJECTIVES

The primary objective of the sampling activities is to obtain representative samples of soil and waste from the American Chemical Services (ACS) site for use in the performance of bench-scale treatability studies of two remedial technologies:

1) In-Situ Soil Vapor Extraction (ISVE)
2) Low Temperature Thermal Treatment (LTTT)

Data use objectives of the sampling program include:

- Collection of representative samples to be utilized to determine the potential effectiveness of ISVE for soils
- Collection of representative samples to be utilized to determine the potential effectiveness of LTTT for soils and wastes

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SCOPE

This Sampling Plan describes the procedures and practices to be used in obtaining samples for use in the development of the treatability studies for the ACS Site. The ACS site is located in Griffith, Indiana as shown on Figure 1. These procedures include a description of the sample locations, sample designation system, personnel and their responsibilities, and the sampling methods to be employed. These methods include:

- Soil borings and soil sampling
- Waste borings and waste sampling
- Auger probes and soil and waste sampling

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LOCATION AND NUMBER OF SAMPLES

The locations of the main areas (Off-Site Containment, and Treatment Lagoon/Still Bottoms Area) to be sampled are shown on Figures 2 and 3.

Number of Samples

ISVE treatability testing will be performed on composite samples collected as follows:

- One contaminated soil sample from the Treatment Lagoon/Still Bottoms Pond Areas. Triple sample volume will be collected in order to perform the bioventing treatability study and a second air flow rate for the ISVE treatability study.
- One contaminated soil sample may also be collected from the Off-Site Containment Area for the ISVE treatability study only.

LTTT treatability testing will be performed on composite samples collected as follows:

- One buried waste sample from the Off-Site Containment Area
- One weighted composite sample of both the contaminated soil and buried waste from the Off-Site Containment Area
- One contaminated soil sample may also be collected from the Off-Site Containment Area.

Up to ten undisturbed soil samples (Shelby tubes) will also be collected from borings co-located with selected soil and waste borings for geotechnical analysis.

LOCATIONS OF SAMPLES

Borings to collect soil and waste samples will be located in the areas shown on Figure 2 for the On-site Areas and Figure 3 for the Off-site Containment Area. The boring numbers referred to below are those performed in the Remedial Investigation at the ACS Site.

On-site Areas

Borings to collect soil samples in the Treatment Lagoon Area for ISVE treatability testing will be located near the following boring/test pit locations:

- SB-15
- SB-16
- TP-4
- SB-73
- SB-74

Off-Site Containment Area

Borings to collect soil samples for ISVE treatability testing will be located near the following borings:

- SB-39
- SB-04
- SB-42
- SB-36
- SB-29

Borings to collect soil samples for LTTT treatability testing will be located near the following borings:

- SB-05
- SB-28
- SB-40
- SB-36
- SB-29
- SB-04

Waste samples for LTTT treatability testing will be collected near the following locations:

- SB-07
- SB-26
- SB-06

- SB-27
- SB-24
- SB-03

These locations are given in order of preference and may be modified in the field. Depending on site conditions, borings may be located near the center of designated areas and away from perimeter locations. Borings will be drilled and sampling continued until an adequate sample volume is obtained (i.e., all of these locations need not be sampled).

Rationale for target location

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SAMPLE DESIGNATION

A sample numbering system will be used to identify each investigative and quality control sample. Each sample identifier will include the project identifier code, sample type and location code, and a sampling event code. The sampler will maintain a log book containing the sample identification listings.

Project Identifier Code
A three letter designation will be implemented to identify the sampling site. The project identifier will be "ACS" to signify this sampling program.

Sample Type and Location Code
Each sample location will be identified by a two letter code corresponding to the sample type. Sample type codes to be utilized for the subtasks covered in this Sampling Plan include:

ST - Shelby tube sample
SS - split-spoon sample
AP - auger probe sample
CO - composite sample

WB - waste boring sample
SB - soil boring sample
TREAT - Treatment Lagoon Sample
OFF - Off-Site Containment Area

Other letter designators may be added as necessary.

The location code will follow the sample type code. The location code consists of a two- to five-digit numeric or alpha-numeric code that indicates the sample location.

Sample Code/Duplicate Code

A two-digit numerical code will be used to designate additional information. Duplicate samples will be designated by the sample code preceded by a 9. For boring samples, the sample code will represent the depth of the sample in feet below the ground surface. For composite samples, the sample code 01 indicates the sample is a composite soil sample, the sample code 02 indicates the composite sample is a waste sample, and the sample code 3 indicates the composite sample contains soil and waste.

Examples of Sample Numbers

An example of a sample number code is as follows:

> ACS-SSWB04-20 = ACS, split spoon sample from Waste Boring 4 at a depth of 20 feet

Composite samples will be designated as follows:

> ACS-COTREAT01-01 = ACS, composite soil sample from the Treatment Lagoon/Still Bottoms Pond Ares

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SAMPLING EQUIPMENT AND PROCEDURES

Soil and Waste Borings

Soil, waste, and geotechnical borings will be marked off in the field prior to drilling activities. Each boring will be blind-drillled initially to four ft below the ground surface and then continuously sampled at two-ft intervals (i.e., 4'-6', 6'-8', etc.) using the ASTM D-1586 method. Borings will be advanced to depths of 8 ft to 20 ft, depending on subsurface findings. Borings will be logged by a Warzyn geologist. Each 3" inside diameter split-spoon sample will be screened using a Photoionization Detector (PID) and with Clor-n-Soil test kits (on selected samples). The samples will then be composited in a stainless steel pan using hand tools, and then placed in appropriate containers. Two to four split-spoon samples from a minimum of five borings will be field composited and submitted for lab analysis.

Compositing of samples to be analyzed for VOCs is considered valid, because relative changes in VOC concentrations are being determined, rather than absolute VOC concentrations. Compositing is necessary to obtain a proper representation of the contaminant matrix across the site for treatability study purposes. The Clor-n-Soil test kits allow measurement of approximate PCB concentrations in the field. PCB field screening will be performed on composite samples to determine their suitability for the respective treatability studies (e.g., PCB concentrations should be relatively high in composite samples for LTTT testing and low in composite samples for ISVE testing.

If split-spoon sampling has poor recovery resulting in inadequate sample volume, samples may be collected directly from auger flights using the auger probe method. The auger probe method involves turning the augers to fill the flights with material, then removing the auger from the borehole to allow access to material on the flight. The material is removed with stainless steel tools or gloved hand, and composited as described above.

Each boring will be filled with bentonite cement grout to the surface. All drilling equipment and tools will be cleaned between composite sampling locations according to procedures outlined in Section 6 and the site Health and Safety Plan.

Geotechnical Borings

Up to ten undisturbed soil samples will be collected with a Shelby tube sampler (ASTM-D-1587 Method). Samples will be collected from borings co-located with selected soil and waste borings.

Personnel and Responsibilities

All personnel working at the ACS site on this Sampling Program will have been trained in health and safety matters relating to hazardous waste site investigations. Efforts will be made to use the same personnel throughout the course of the field work to optimize familiarity with site conditions.

A two-person drilling crew and one field technician will be supervised by a geologist or engineer. The geologist or engineer will also serve as the Safety Officer. Samples will be collected and logged under the supervision of the geologist.

6

DECONTAMINATION PROCEDURES

Procedures to be followed to decontaminate equipment and personnel are described in the Site Health and Safety Plan. Please refer to it for specific information pertaining to site procedures.

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SAMPLE HANDLING AND ANALYSIS

Parameters

The composite samples collected for the treatability studies test will be analyzed for the following parameters: volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyl compounds (PCBs), tentatively identified compounds (TICs), and total organic carbon (TOC).

In addition, undisturbed soil samples (i.e. Shelby tubes) will be analyzed for the following geotechnical parameters: pH, permeability, porosity (Pore Volume), total solids, natural moisture content, and grain size analysis. Samples for a bacterial plate count will also be taken from the same borings as the above geotechnical samples.

The analytical methods are listed in Table 1.

Sample Preservation

All soil and waste samples collected in the field will be placed in their appropriate containers, stored in coolers, and then shipped to the laboratory for analysis.

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SAMPLE DOCUMENTATION

Samples will be collected under chain-of-custody procedures. Standard forms including sample labels, sample tags, chain-of-custody forms, and custody seals used for sample tracking will be maintained. A brief description of sample documents follow:

A. Chain-of-Custody Form
   1. One Form per shipping container (cooler)
   2. Carrier service does not need to sign form, if custody seals remain intact
   3. Use for all samples

B. Chain-of-Custody Seals
   1. Two seals per shipping container to secure the lid and provide evidence that samples have not been tampered with
   2. Cover seals with clear tape
   3. Record seal numbers on Chain-of-Custody Form
   4. Use for all samples

C. Sample Tags
   1. Each sample container must have a sample tag affixed to it
   2. Sample tag numbers are recorded on the Chain-of-Custody Forms
   3. Use for all samples

D. Sample Identification Record Form will:
   1. Provide means of recording crucial sample shipping and tracking information

2. Contain information such as:
    - Sample number
    - Sample matrix
    - Sample location code
    - Sample code
    - Chain-of-custody number
    - Lab Name
    - Date sampled
    - Date shipped
    - Airbill number
    - Sampling tag number

Paperwork accompanying the samples being shipped to the laboratory will be sealed in a plastic bag that is taped to the inside of the cooler lid. Copies of the chain-of-custody forms, and other paperwork (if possible), will be retained for the field files.

Two sample seals will be placed on opposite sides of the lid and extending down the sides of the cooler. The lid will be securely taped shut prior to shipment.

Representative photographs will be taken of sampling stations to show surrounding area and used to locate the station. The picture number and roll number will be logged in the field log book to identify which sampling site is depicted in the photograph. The film roll number will be identified by taking a photograph of an informational sign on the first frame of the roll. This sign would have the job and film roll number written on it so as to identify the pictures contained on the roll.

For example:

American Chemical Services
Roll Number 1
Frame Number 1 of 36
16 Dec 1992

All sampling documentation will be maintained in Warzyn files as outlined in the QAPP.

KAW/njt/DAP
[CHI 605 83]
20007001

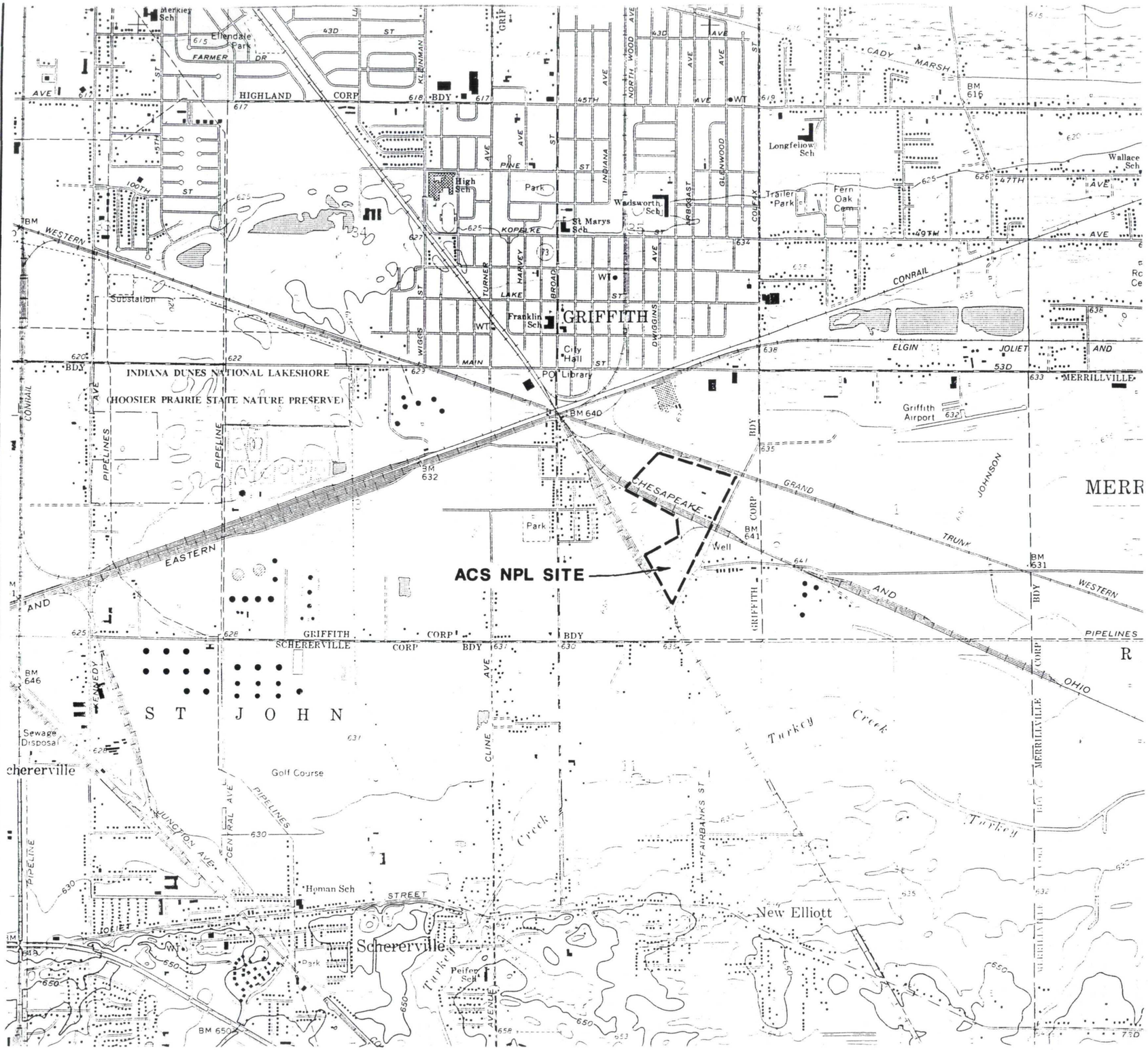
TABLE 1

Analytical Methods

Parameter	Analytical Method
Bacterial Plate Count	Conventional Plate Count Method or Equivalent
pH	SW846 Method 9045
Permeability	SW846 Method 9100
Pore Volume	ASTM D4404
Natural Moisture Content	ASTM D2216-90
Total Solids	SW846 Method E160.3
Total Organic Carbon Content	ASTM D2974-87 or SW846 Method 9060
Grain Size Analysis	ASTM D422-90
VOCs + TICs	SW846 Methods 8240 using the U.S. EPA Target Compound List
SVOCs + TICs	SW846 Method 8270 using the U.S. EPA Target Compound List
PCBs	SW846 Method 8080 using the U.S. EPA Target Compound List

MJH/njt/
[CHI 605 83]

FIGURES



NOTES

1. BASE MAP DEVELOPED FROM HIGHLAND AND ST. JOHN, INDIANA 7.5 MINUTE USGS TOPOGRAPHIC QUADRANGLE MAPS DATED 1968 AND 1962 RESPECTIVELY, PHOTOREVISED 1980.

north

0 2000 4000

SCALE IN FEET

FIGURE 1

QUALITY CONTROL
Graphic Standards D.L.L.
Lead Professional

Technical Review
Project Manager M.J.H.

Management Review
Other

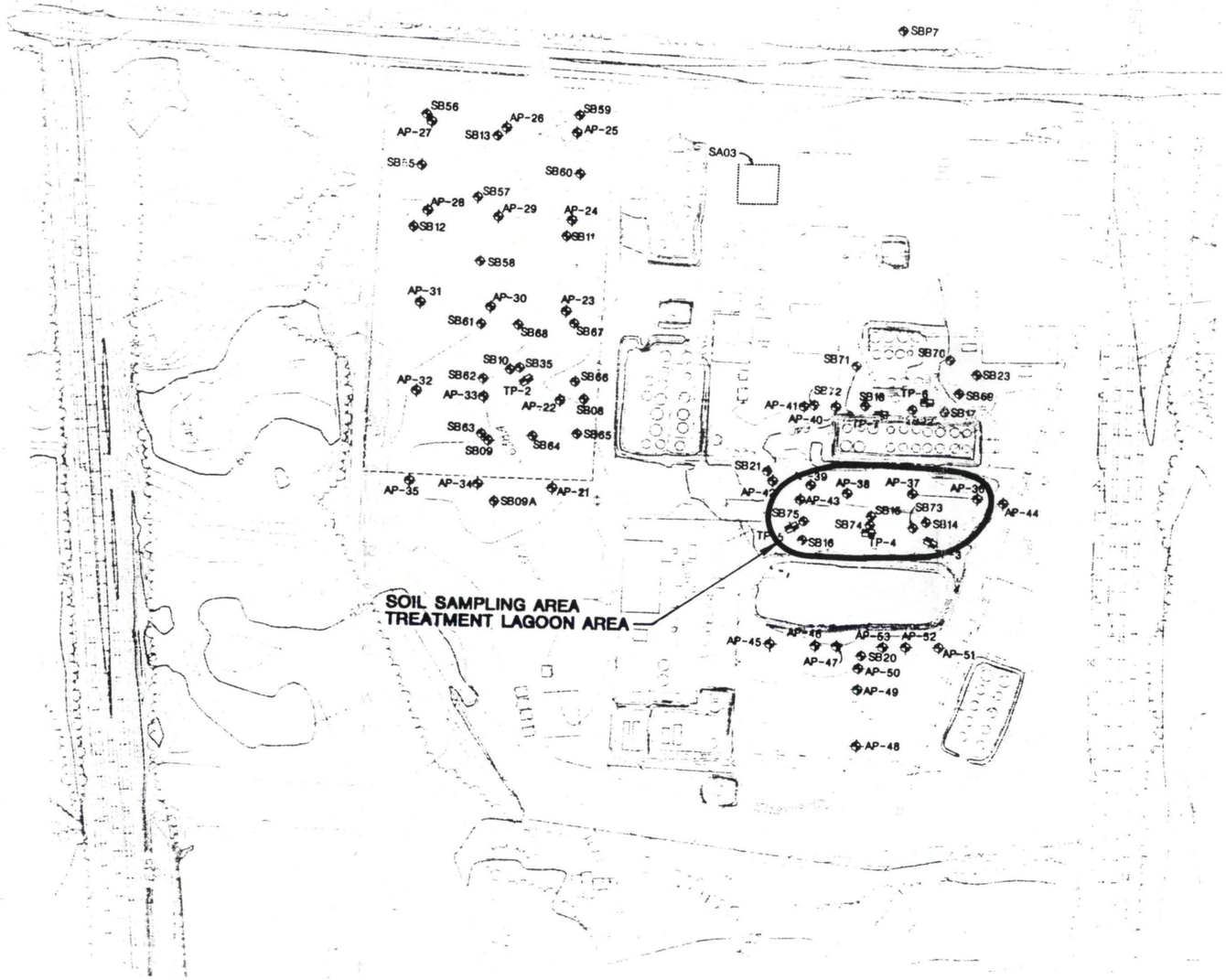
WARZYN INC.

Developed By: MJH
Drawn By: DLL
Approved By: M. Hampu
Date: 12-15-92
Reference:
Revisions:

SITE LOCATION MAP
TREATABILITY TESTING
AMERICAN CHEMICAL SERVICES
NPL SITE
GRIFFITH, INDIANA

Drawing Number
20007001 B3

WARZYN



LEGEND

-----	GEOPHYSICS INVESTIGATION AREA
SB-01	SOIL BORING LOCATION AND NUMBER
AP-01	AUGER PROBE LOCATION AND NUMBER
TP-1	TEST PIT LOCATION AND NUMBER
SA01	SOIL AREA LOCATION AND NUMBER
▬▬	BENCH-SCALE TREATABILITY TESTING PROPOSED SAMPLING AREA

NOTES

1. INITIAL BASE MAP WAS DEVELOPED FOR CAMP DRESSER & MCKEE INC. ON NOVEMBER 8, 1965. MAP HAS BEEN UPDATED FROM AN AERIAL PHOTOGRAPH OF THE SITE FLOWN ON NOVEMBER 3, 1989 BY GEONEX CHICAGO AERIAL SURVEY, INC. THE BASE MAP WAS UPDATED BASED ON THE AERIAL PHOTOGRAPH BY GEONEX.
2. VERTICAL DATUM IS USGS DATUM. CONTOUR INTERVAL IS (1) ONE FOOT.
3. SOIL BORINGS SB01 TO SB18 AND AUGER PROBES AP-1 TO AP-44 FOR PHASE I WERE DRILLED BY EXPLORATION TECHNOLOGY INC. (ETI) UNDER THE SUPERVISION OF WARZYN IN AUGUST AND SEPTEMBER 1989.
4. SOIL BORINGS SB20 TO SB75 AND AUGER PROBES AP-45 TO AP-83 FOR PHASE II WERE DRILED BY EXPLORATION TECHNOLOGY INC. (ETI) UNDER THE SUPERVISION OF WARZYN IN MAY AND JUNE 1990.
5. LOCATIONS FOR SOIL BORINGS WITH SAMPLING AND TEST PITS WERE FIELD LOCATED BY EWI ENGINEERING ASSOC. SURVEYORS.
6. LOCATIONS OF AUGER PROBES ARE APPROXIMATE.
7. SOIL BORING NUMBERS SB19 AND SB34 DO NOT EXIST.

north

0 150 300

SCALE IN FEET

FIGURE 2

Developed By: MJH Drawn By: DLL
Approved By: MJH Date: 12-15-92
References:
Revisions:

PROPOSED SOIL AND WASTE SAMPLING AREAS ON-SITE AREAS

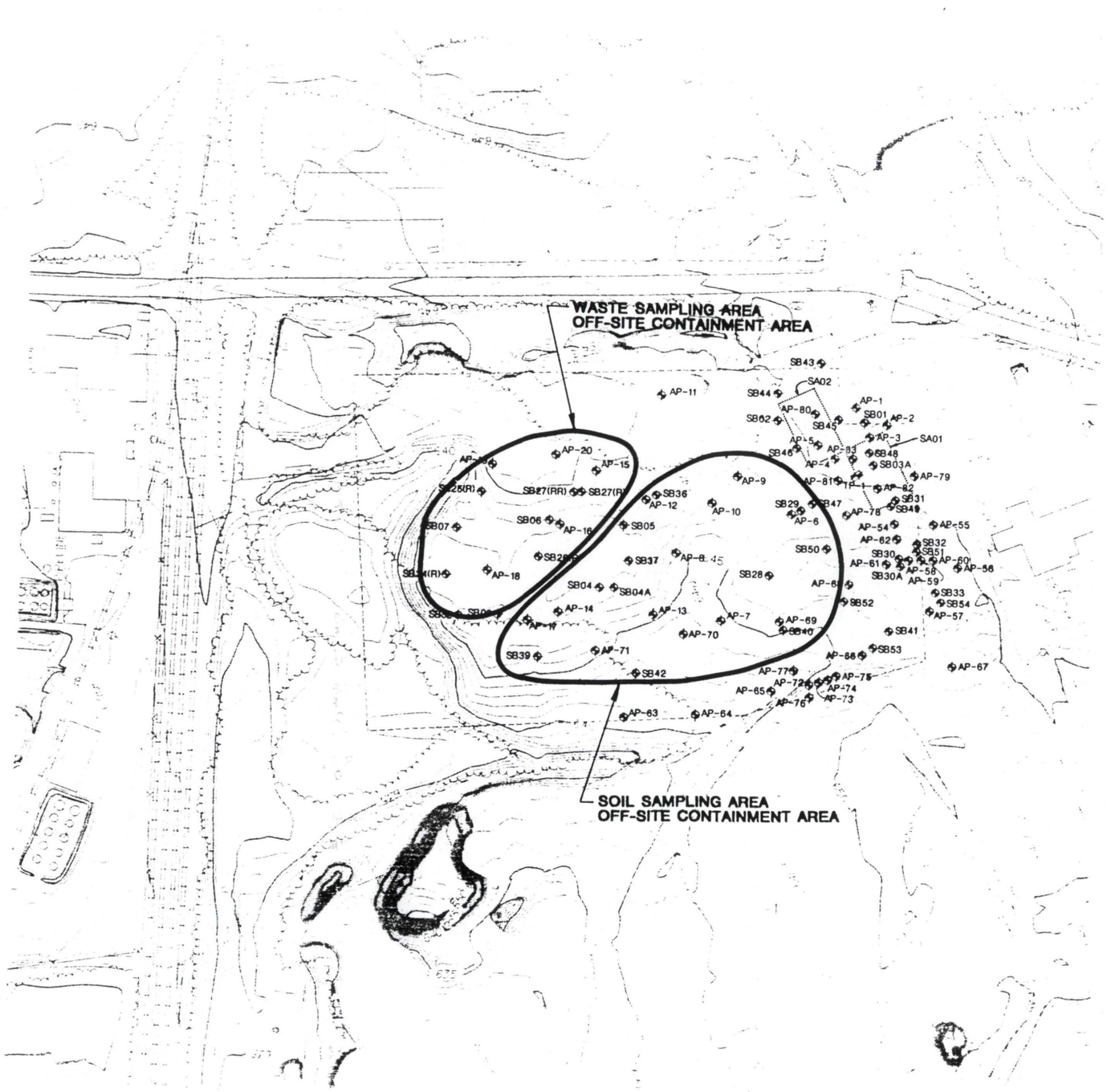
TREATABILITY TESTING
AMERICAN CHEMICAL SERVICES
NPL SITE
GRIFFITH, INDIANA

Drawing Number
20007001 **B1**

WARZYN

QUALITY CONTROL
Graphic Standards DLL
Lead Professional
Technical Review
Project Manager M.J.H.
Management Review
Other

WARZYN INC.



LEGEND

-----	GEOPHYSICS INVESTIGATION AREA
SB-01	SOIL BORING LOCATION AND NUMBER
AP-01	AUGER PROBE LOCATION AND NUMBER
TP-1	TEST PIT LOCATION AND NUMBER
SA01	SOIL AREA LOCATION AND NUMBER
▬▬	BENCH-SCALE TREATABILITY TESTING PROPOSED SAMPLING AREA

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north

0 150 300

SCALE IN FEET

FIGURE 3

Developed By: MJH
Drawn By: DLL
Approved By: M. Hamper
Date: 12-15-92
Reference:
Revisions:

PROPOSED SOIL AND WASTE SAMPLING AREAS OFF-SITE CONTAINMENT AREA

TREATABILITY TESTING
AMERICAN CHEMICAL SERVICES
NPL SITE
GRIFFITH, INDIANA

Drawing Number
20007001 B2

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QUALITY CONTROL
Graphic Standards D.L.C.
Lead Professional

Technical Review
Project Manager M.J.H

Management Review
Other

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